FIELD INVESTIGATIONS OF UNCONTROLLED HAZARDOUS WASTE SITES

FIT PROJECT

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TASK REPORT TO THE ENVIRONMENTAL PROTECTION AGENCY CONTRACT NO. 68-01-6056

EMERGENCY ACTION PLAN

ON

BLUFF ROAD SITE, SOUTH CAROLINA

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1 EXECUTIVE SUMMARY

This Emergency Action Plan (EAP) identifies the potential health and environmental hazards that are associated with the South Carolina Recycling and Disposal, Inc. (SCRDI) Bluff Road site, and presents recommendations for response action measures that will temporarily abate these hazards. The Bluff Road site is a 2 acre chemical waste storage area located on State Highway 48 (Bluff Road) about seven miles southwest of Columbia, South Carolina. The site contains an estimated range of 3,000 to 10,000 waste containers that are in various conditions and filled to varying levels. Of the wide number of waste materials suspected at the site, many are toxic, flammable or reactive, and present threats to environmental quality and human safety. A recent, yet-to-be published study by the State of South Carolina Department of Health and Environmental Control (SCDHEC) found that the groundwater near the Bluff Road site is contaminated by organic chemicals that are most likely originating from the facility.

The objective of the response action strategy recommended for Bluff Road is to provide for the stabilization of all hazardous conditions until final cleanup measures can be implemented. Response actions recommended in this EAP include the following major tasks:

1. Development of a contingency/evacuation plan for local citizenry to implement in case of a catastrophe at the site;

2. Placement of monitoring wells around the site to locate and characterize the groundwater contaminant plume that is suspected to exist;

3. Aquisition and preparation of neighboring property for use as staging, buffer and management areas;

4. Recontainerization of materials presently in deteriorating drums and reorganization of all drums to facilitate future sampling; and

5. Removal of all contaminated soils to secure containers.

The estimated cost of the above remedial measures is $975,000. It is anticipated that the ultimate site remedial action approach will incorporate a cost-effectiveness study to evaluate disposal alternatives, and the development of an on-site waste batching protocol that will conform to disposal requirements and safety considerations.

2 INTRODUCTION

2.1 THE EMERGENCY ACTION PLAN

Under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, commonly called Superfund, the President is authorized to commit federal resources in response to known or threatened releases of hazardous substances or contaminants that pose an imminent and substantial environmental danger. In January 1981, Ecology and Environment, Incorporated (E & E) was tasked by the Environmental Protection Agency (EPA) to prepare Emergency Action Plans for sites affected by Superfund. This planning document was developed to assess the hazardous conditions at a site, and to recommend all necessary hazard abatement actions that should be implemented by EPA under Superfund guidelines. Federal response actions are limited to a maximum of $1,000,000 and six months duration except for extreme circumstances. These actions can include, but are not limited to, cleanup, removal, disposal, monitoring, assessment, preventive and mitigative measures, security measures to limit access, provision of alternative water supplies, temporary evacuation and housing, and others as may be necessary.

2.2 SITE BACKGROUND

South Carolina Recycling and Disposal, Inc. (SCRDI), began operations during the mid-nineteen seventies to dispose of or reclaim and resell wastes generated by chemical manufacturers. SCRDI's present waste storage center, commonly known as the "Bluff Road" site, is located about seven miles southeast of Columbia, South Carolina. From 1977 until the State of South Carolina requested a halt in waste shipments to the site in late 1980, the Bluff Road site and a site known as the Dixiana site served as

holding areas for wastes that could not be readily resold at the SCRDI "marshalling" site on Shop Road. Wastes transferred to the sites were segregated according to their potential for reuse. According to SCRDI officials, wastes that required disposal were shipped at various intervals to incinerators operated by Destructo Chemway in North Carolina and Liquid Waste Disposal of Kentucky, Inc. in Louisville. However, incoming waste quantities exceeded those which SCRDI was able to resell or dispose during its period of operation. When the potential hazards at each site became apparent to State officials, the State requested that all wastes owned by SCRDI be consolidated at the Bluff Road site to confine their hazards to one location. Consequently, wastes have accumulated at the Bluff Road site since 1977 to present estimates of between 3,000 and 10,000 waste-filled containers.

In October 1977 a chemical waste material in a poorly sealed drum apparently reacted with rainfall, causing the emission of a thick white vapor into the air. Before Columbia Fire Department personnel could contain the fumes by burying the drum, an estimated 50 persons were admitted to a local hospital for treatment of injuries associated with the vapor cloud (1).

Following the vapor incident the South Carolina Department of Health and Environmental Control (SCDHEC) issued a notice to SCRDI that the conditions at Bluff Road constituted an "immediate public health nuisance". SCDHEC instructed the company to remove specified materials from the site to an approved disposal location and to provide the State with an inventory of all other materials at the site. By December 1977 these actions had been accomplished by SCRDI.

In May 1979 the SCDHEC initiated legal action to obtain a temporary injunction that would halt SCRDI activities at Bluff Road and require site cleanup. When this case was lost in court, SCDHEC turned its efforts toward obtaining a permanent injunction against SCRDI. This latter action had not been finalized by the issuance date of this report.

In March 1980 EPA personnel took samples from stained soils, the water and sediments in nearby drainage ditches, several nearby water supply wells and from nearby Myers Creek. Analyses of the samples from Myers Creek and the water supply wells yielded inconclusive results. However, metals levels in nearby drainage ditches were significant and corresponded to those found in the stained soils on site. The study concluded that contaminated runoff was probably leaving the site during rainfall periods and contaminating shallow groundwater near the site (2).

As a result of the EPA study, the agency filed suit in July 1980 to (1) halt further acceptance of chemical wastes at Bluff Road, (2) abate the environmental problems caused by the existing wastes, and (3) properly dispose of all wastes at the site. This action was pending further litigation at the time of issuance of this report.

A December 1980 analysis by the SCDHEC of the groundwater quality around the Bluff Road site identified high levels of organic chemical contamination in adjacent shallow groundwater. The yet to be published report will probably conclude, according to SCDHEC representatives, that the SCRDI facility is the source of the groundwater contamination (3).

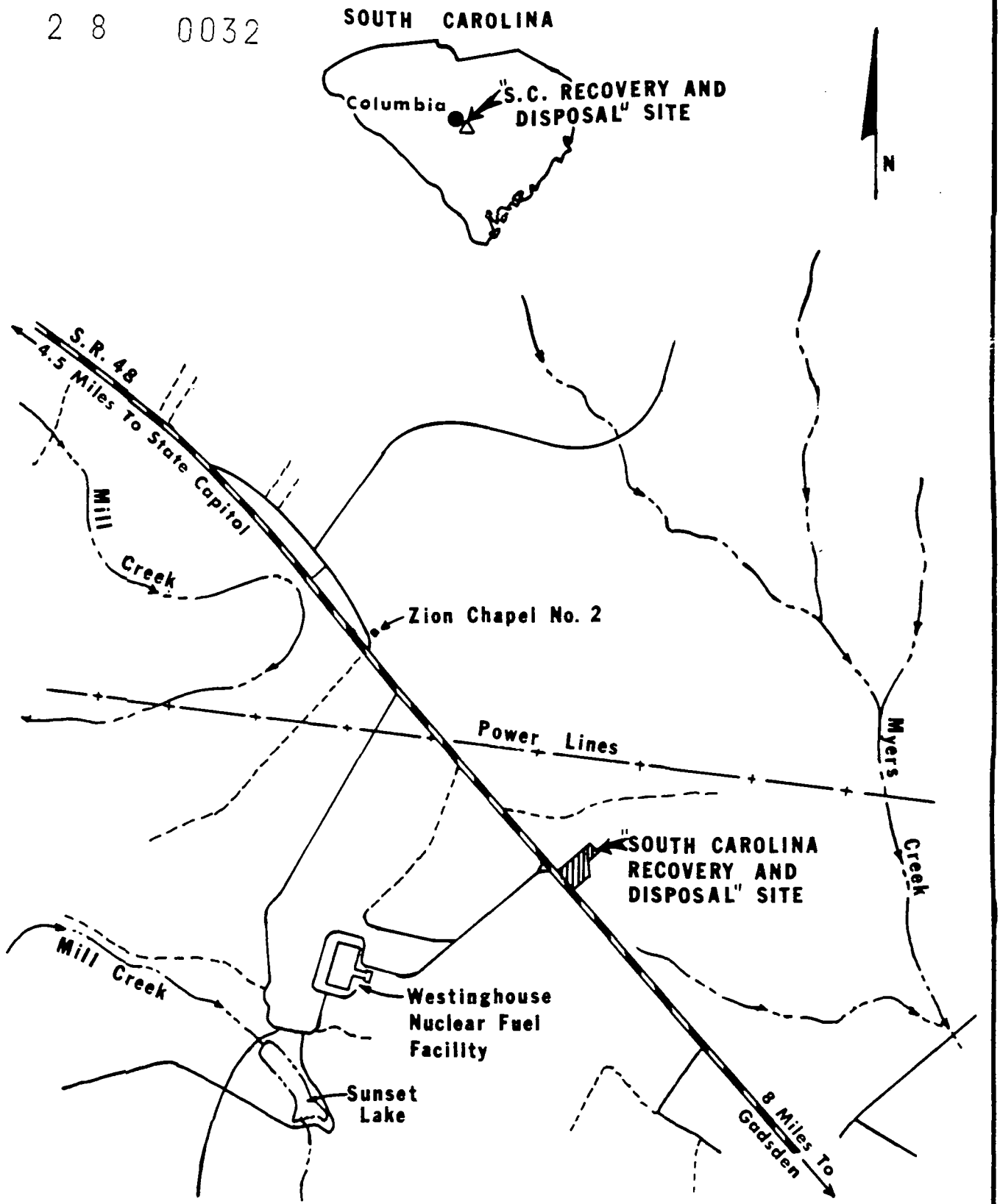
3 SITE CHARACTERISTICS

3.1 SITE LOCATION & DESCRIPTION

The SCRDI Bluff Road storage site is located on State Highway 48 (Bluff Road) about 7 miles southeast of downtown Columbia, South Carolina. The property, leased from Mr. Oscar Seidenberg, covers about 7 acres, of which about 2 acres are actually used for waste storage. Figure 3-1 shows the location of the Bluff Road site in relation to downtown Columbia and other features of the area.

Immediately east of the Bluff road storage area is a small lot once occupied by an auto salvage yard but now empty except for a small, fire-damaged building. Directly across State Highway 48 from the Bluff Road site is the main entrance to the Westinghouse Nuclear Fuel Plant, whose buildings are located about 1/4 mile from the highway. The facility, which employs about 100 people, assembles fuel rods that are used in nuclear power plants.

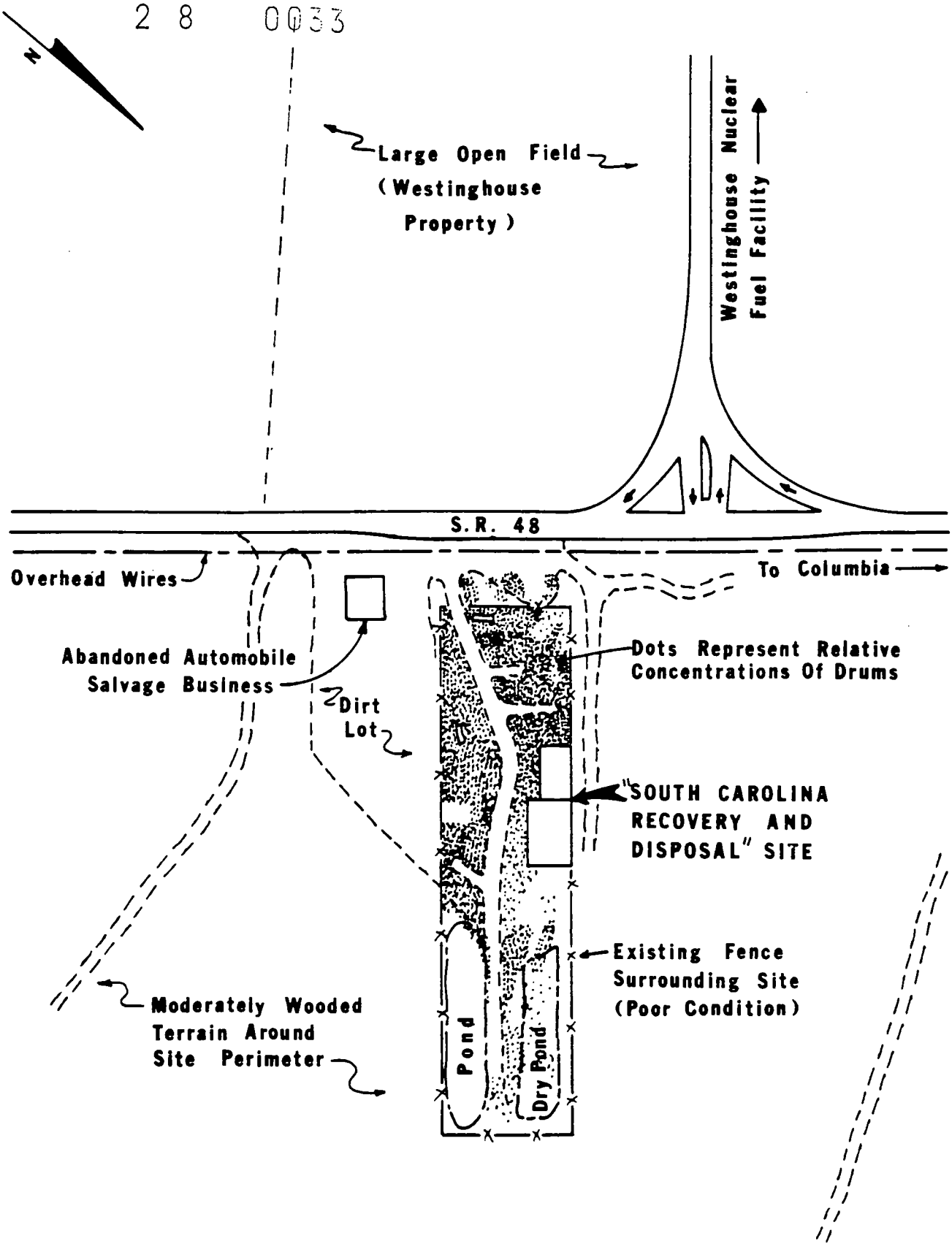
As shown in Figure 3-2, the storage site is characterized by a central metal-walled building in which salvageable wastes are stored. Two small ponds located at the northern end of the site are remnants of the lime slurry disposal ponds used by the acetylene manufacturer that once occupied the property. The western pond contains dried lime and is usually dry; the eastern pond usually holds water at a depth of about 30 cm. Waste containers cover most of the open space within the storage area with the exception of an unpaved entrance drive from the highway to the building. The containers are mostly 55 gallon drums of which many are stacked two-high, but smaller cans, bottles and jars are scattered throughout. The storage area is circled by a six-foot-high chain link



SITE LOCATION MAP

FIGURE 3-1

Scale : 1" = 2000'



EXISTING SITE LAYOUT

FIGURE 3-2

Source: Feb. 2, 1980 Aerial Photograph

Not To Scale

fence which is in poor condition in several places and open near the rear of the site. Drums that have been placed between the highway and the front gate were recently enclosed by another chain link fence by order of the SCDHEC.

3.2 HYDROGEOLOGIC SETTING

About two thirds of Richland County lies within the Coastal Plain physiographic province. The Bluff Road site, which lies south of the Fall Line in the Coastal Plain, is located between the Congaree River flood plain and the Sand Hills south of the Piedmont province. The site area is nearly level with only very gentle slopes (approximately two to three percent). Streams cross the region, but very few originate within it. Elevations in the Coastal Plain range from 100 feet to 250 feet above mean sea level. Elevation at the site is approximately 135-138 feet.

Soil at the site is representative of the Orangeburg series - a deep, sandy clay loam that formed in thick, loamy marine sediment on broad ridges and interstream divides on Coastal Plains uplands. The fine to medium grained material is very friable, moderately permeable, well drained, and medium to strongly acidic (4).

Surficial deposits are part of the Okefenokee Marine Terrace, a clastic unit of Pliocene to Pleistocene Age. These deposits typically consist of quartzitic and feldspathic sand and gravel which commonly are 45 to 50 feet thick in the area of Bluff Road, with interfingering clay lenses (3). The Black Mingo Formation of Eocene age underlies the surficial deposits. This unit is dominantly gray to black clay interlayered with some sandy lenses.

The surficial unit is the primary local unconfined aquifer. Water, up to hundreds of gallons per minute, is commonly available less than 50 feet below the surface. Limited amounts of water (up to 50 gallons per minute) may be obtained from some of the sand lenses of the Black Mingo.

Hydrological studies by the South Carolina Department of Health and Environmental Control during September 1980 indicate that ground water

flow at the Bluff Road Site is toward the east and northeast (3). The water table varies between approximately 2 feet and 10 feet below the surface and thus is highly susceptible to contamination from surficial pollution sources. Water samples taken from wells immediately adjacent to the landfill were found to contain high levels of organic chemicals, indicating that this aquifer is contaminated (3).

3.3 BIOLOGICAL SETTING

The South Carolina Recycling and Disposal, Inc. Bluff Road facility is located adjacent to a swamp-wetland habitat. Numerous small drainage ditches and one intermittent stream exist around the site.

The United States Fish and Wildlife Service has not identified any endangered or threatened plant species which occur in the vicinity of this site, nor is the region considered to be a critical habitat. However, it does lie within the range of the bald eagle (Haliaeetus leucocephalus) and the red-cockaded woodpecker (Picoides (=Dendrocopus) borealis). The swamp-wetland habitat supports an abundance of mammalian species. However, the only endangered mammalian species in the area is the Florida panther (Felis concolor corvi) (5).

4 HAZARD ASSESSMENT

4.1 WASTE MATERIALS PRESENT

Waste materials at the Bluff Road site are stored in 55 gallon drums, 5 gallon cans, one gallon glass jugs, and assorted other reagent-type bottles and cans that are scattered throughout the site. Most of the wastes are stored in the estimated 3,000 to 10,000 drums. Some of these drums are covered and in good condition, but many are in various states of deterioration, with some actually leaking or completely drained. The numerous waste containers are tightly packed on the site and extend to less than 10 meters from the highway. Ground stains caused by spillage or leaking containers are apparent thoughout the site and near the northern ponds.

In 1977, at the request of the South Carolina Department of Health and Environmental Control, SCRDI officials compiled inventories of the chemicals stored at its Dixiana, Shop Road and Bluff Road sites. Since this effort, SCRDI has consolidated all of its wastes at the Bluff Road site. Therefore, for the purpose of assessing potential hazards at the site, the three site inventories were consolidated to provide a general idea of the types of wastes currently stored at Bluff Road.

From a consolidated inventory it is apparent that a wide range of organic and inorganic chemical compounds are stored at the Bluff Road facility. Using the quantities provided by SCRDI officials as a guide, significantly hazardous waste chemicals that are likely present at the Bluff Road site are listed in Table 4-1. It must be noted, however, that the SCRDI waste inventories were based on shipping manifests and compiled several years ago. Thus, an updated and more accurate inventory of the substances stored at Bluff Road could include chemicals not listed in Table 4-1.

BLUFF ROAD SITE
EMERGENCY ACTION PLAN

TABLE 4-1
SIGNIFICANTLY HAZARDOUS SUBSTANCES LIKELY TO BE PRESENT AT BLUFF ROAD

Substance[1]	Toxicity[2]	Flammability[2]
Acetone	moderate	high
Acetonitrile	high	high
Acrylonitrile	high	high
Butyraldehyde	moderate	very high
Carbon Tetrachloride	high	low
Chromic Acid Sludge	high	high
Ethyl Acetate	moderate	high
Ethyl Chlorohydrin	high	moderate
Ethyl Methacrylate	moderate	high
Formaldehyde	high	moderate
Hexane	high	high
Hydrazine Hydrate	high	explosive
Pesticides (assorted)	high	low
Mercuric Oxide (yellow)	high	moderate (high in presence of organics)
Phosphorous Pentasulfide	high	high
Toluene	high	high
Vinyl Acetate	low	high

[1] Source: Inventory submitted to State of South Carolina by South Carolina Recycling and Disposal, 21 December, 1977

[2] Source: Sax, N. Irving, Dangerous Properties of Industrial Materials, Fifth Edition, 1979.

4.2 WASTE HAZARD CHARACTERISTICS

Without further sampling and analyses, the most prudent hazard assessment for the Bluff Road site would be based on the waste inventories compiled in 1977 by SCRDI at the request of the State. These lists include numerous highly toxic substances, including formaldehyde, chromic acid sludge, an unknown mixture of pesticides, toluene, halogenated hydrocarbon solvents, sodium flouride, and mercuric oxide (yellow) (6). These substances are stored at the site with other chemicals that are highly reactive and/or flammable (7). This latter group includes numerous flammable organic solvents, sodium hydride, zirconium tetrachloride, hydrozine hydrate, 2,4 dinitrophenylhydrazine and phosphorous oxychloride. Documentation of one hazard posed by phosphorous oxychloride lies in the 1977 vapor cloud incident. Site reports suggest, and the known characteristics of the compound support, that rainwater probably reacted with the phosphorous oxychloride to form hydrogen chloride, a highly corrosive white vapor.

In making assumptions about their possible impact on health or the environment, there is little need to discuss the specific hazards posed by the chemical wastes stored at the site. In the planning of any on-site activity it must be assumed that the hazardous substances listed for the Bluff Road site represent essentially every type of safety and environmental hazard.

4.3 POTENTIAL HEALTH AND ENVIRONMENTAL IMPACTS

The abundance of leaking or spilled substances at the Bluff Road site, coupled with the sandy, porous nature of the soils present, suggests that a high potential for groundwater contamination exists. This potential has been initially verified by recent SCDHEC findings of high organics levels in monitoring wells adjacent to the site. Continued existence of the Bluff Road site as it is now operating could cause the contamination of drinking water wells in the area and possible human exposure to hazardous chemicals.

The large number of chemical compounds maintained under poor handling and storage practices presents the chance that two leaking, incompatable substances could mix and result in fire, explosion or toxic gas release. The highly flammable or reactive nature of many of the wastes suggests that, in the presence of the heat from one fire, other containers could rupture and cause a chain of explosions, fires or toxic gas releases.

A specific potential for human exposure is presented by the proximity of the Westinghouse facility to the Bluff Road site. Should another toxic gas cloud be released with supporting wind conditions, workers at Westinghouse could suddenly encounter highly toxic exposure. One is therefore compelled to characterize the SCRDI site as being imminently hazardous.

Finally, the fumes and vapors that have been documented by site inspectors to continually exist at the Bluff Road site present a potential hazard to on-site workers. These fumes, to which SCRDI employees are continually exposed, have been noted to cause dizziness and are particularly strong during warmer months.

5 CONCLUSIONS

The Bluff Road chemical waste storage site contains thousands of drums, cans and bottles of a wide range of substances that are toxic, ignitable or reactive. These wastes are stored in such close confines and in such poorly sealed containers as to pose the threat of groundwater contamination, of fire, explosion or the production of toxic fumes caused by accidental mixing. The existence of groundwater contamination has already been implicated by a recent study by the State of South Carolina. It is therefore logical to conclude that the hazardous conditions existing at Bluff Road site will require final cleanup action. Because it is possible that an incident at the site that might cause a threat to human health could occur at any time, steps should be taken as soon as possible to temporarily abate these dangers until cleanup measures can be designed and implemented.

6 RECOMMENDATIONS

6.1 DEFINITIONS OF RESPONSE AND REMEDIAL ACTIONS

This section serves to identify the steps recommended to abate the potential hazards to human health and the environment existing at the Bluff Road site, and to provide for the ultimate disposal of the hazardous materials at the site. These recommendations are divided into the categories of response actions and remedial actions. Response actions pertain to those measures which can be implemented to control hazardous conditions at a site with a minimum of planning and design requirements (in this context, hazardous conditions are defined as those which pose an imminent danger to human health or environmental quality). Response actions can be temporary, if determination of an ultimate cleanup approach is contingent upon time-consuming steps such as detailed engineering design, legal actions, or extended sampling and analyses programs. Alternately, a response action may provide a permanent solution to a hazardous waste site problem if it can be quickly and effectively implemented and if it also represents the most cost-effective long-term solution. By the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, response actions are limited by a maximum expenditure of $1,000,000 or 6 months in duration, whichever comes first.

Remedial actions pertain to the ultimate disposition of a hazardous waste site. Such actions include the engineering design, preliminary sampling and analyses, and/or even litigative action, if necessary or unavoidable, as well as the actual cleanup measures that might be required to permanently abate all dangers associated with hazardous wastes. Under the 1980 Act, funding for remedial actions must be provided in part

state (10% in most cases). It is felt that the hazards present at the Bluff Road site demand both immediate and long term abatement measures. The specific steps that should be taken under a response action, and general guidelines for developing a remedial action strategy are presented below.

6.2 RECOMMENDED RESPONSE ACTIONS

The recommended actions to alleviate the imminent hazards at the Bluff Road Site are listed in the order that they should be implemented.

6.2.1 Drum Count Estimation

To date no accurate estimate has been made of the number of drums at the Bluff Road Site. However, some figure will inevitably be required by contractors and regulatory authorities for estimating contract prices and the ultimate costs of removal. Such an estimation could be obtained quickly and relatively cheaply through the analysis of low-level aerial photographs of the site by experienced photoimagery analysts. A drum count estimation using this approach should be performed as soon as possible.

6.2.2 Contingency Plan

Prior to any on-site activity that will involve the handling of chemical wastes, a contingency plan should be developed, approved and distributed. Such a plan would be developed by a committee composed of EPA, State and local government representatives as well as representatives of the Westinghouse facility. It should include the identification of the types of on-site activities that might require traffic stoppage on State Highway 48, and outline escape routes for Westinghouse workers and other personnel in the event of a catastrophe at the site. Detour routes for traffic on highway 48 must also be identified and readied for implementation.

6.2.3 Work Space Acquisition

The Bluff Road site alone will not accomodate space requirements for sorting and moving waste containers effectively, nor will it allow for

6.2.3 Work Space Aquisition

The Bluff Road site alone will not accomodate space requirements for sorting and moving waste containers effectively, nor will it allow for the location of the project command center beyond a safe distance from the wastes. Furthermore, the property surrounding the Bluff Road site on all but the east and south is wooded and frequently marshy. Therefore, permission should be obtained from the respective owners to employ about 6 acres of the property in and around the abandoned auto salvage yard to the east as a staging area during site cleanup activities and to use about 4 acres of the Westinghouse property as a buffer zone and project management area. Figure 6-1 presents a suggested layout of the staging, buffer and management areas to be used during the response action.

6.2.4 Staging Area Preparation

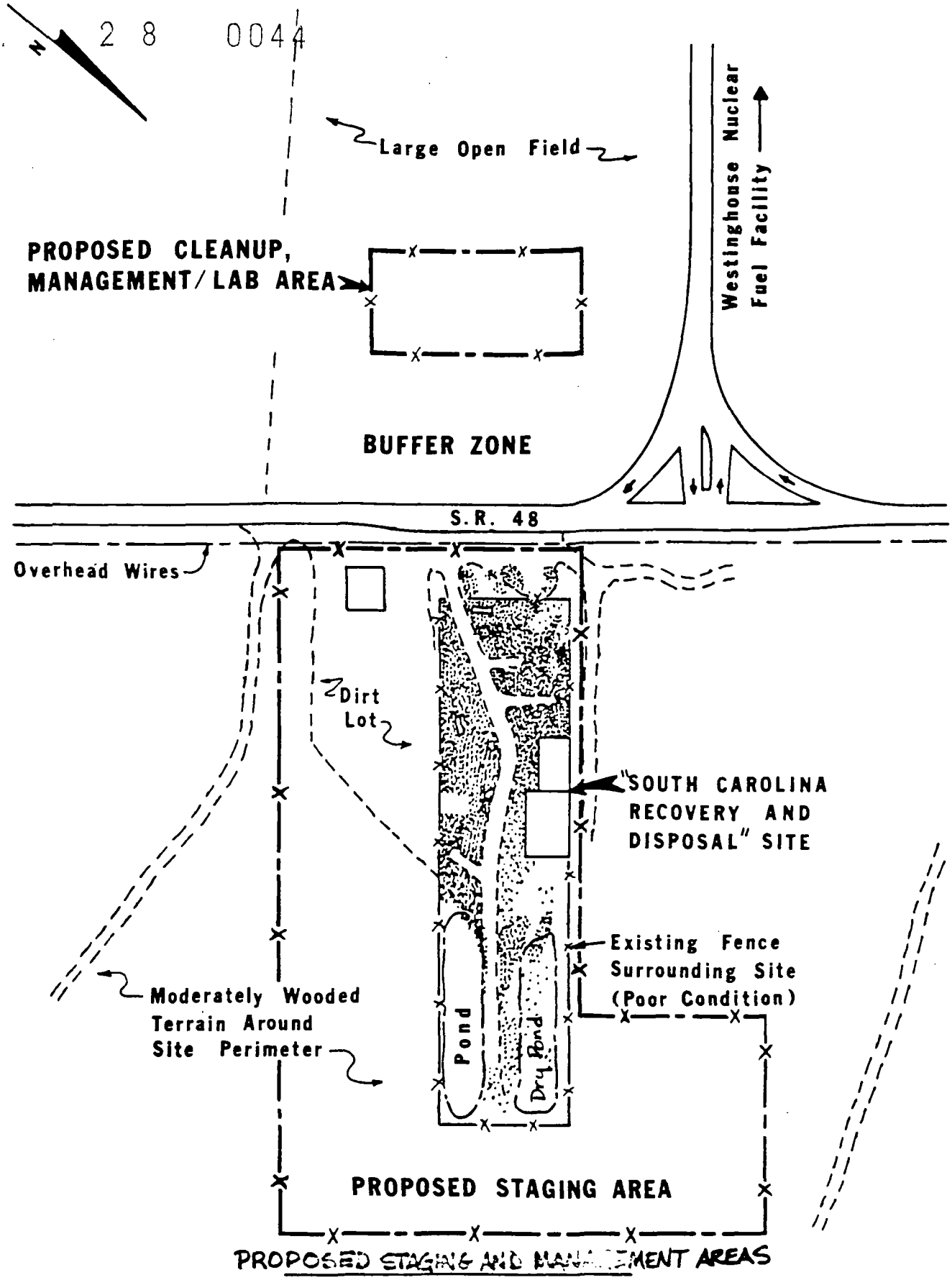
As soon as use of the proposed staging area is arranged, trees and shrubs should be cleared within the 6 acre area and the site should then be graded. Following grading, an approximately one foot thick layer of an impervious clay material should be applied to the site to prevent contamination of the groundwater from materials that might be spilled during cleanup operations. It is recommended that the Fuller's Earth material that is mined locally be evaluated for its suitability to this application.

6.2.5 Site Security

The Bluff Road site should be fenced, with a large opening provided to the staging area and a gate on the highway side. Similarly, upon suitable arrangements with the owners, the areas determined necessary to accomodate staging efforts, a buffer and a command center should be fenced to protect equipment from theft or vandalism.

6.2.6 Characterization of the Groundwater Contamination

A suitable number of bore holes should be augered to determine the extent of the contaminated groundwater plume around the site. The bore holes will also be used to determine the hydraulic gradient. With these



PROPOSED STAGING AND MANAGEMENT AREAS

FIGURE 6-1

Not To Scale

determinations, monitoring wells, in a number dictated by the extent of the plume, should be installed at its leading edge and samples should be taken and analyzed periodically to determine migration rates and quantities.

6.2.7 Waste Recontainerization and Segregation

Waste materials in leaking, deteriorating or unlidded containers should be transferred to new or structurally sound, sealable containers. This can be accomplished either by pumping the contents from a deteriorating drum to a new drum or overpacking the deteriorating drum with a larger container.

Since the drums and containers are tightly packed at the Bluff Road site, gaining access to leaking drums will require the moving of many sound drums as well. Therefore, it is recommended that the drum recontainerization effort be coupled with the organization of all drums in a manner that will allow for easy sampling of their contents later. this reorganization of drums should be performed at the 6 acre staging area.

As the recontainerization effort progresses, sound drums should be transferred to the staging area according to a well-defined organization scheme that might include the segregation of liquid and solid wastes when known, or other identifying features of the materials. Finally, all other containers or contaminated refuse on the Bluff Road site should be transferred to the clay-lined staging area. It should be noted that a Spills Prevention, Containment and Countermeasures (SPCC) plan must be developed for use in case of accidental waste spillage during all site cleanup phases.

6.2.8 Contaminated Soils Removal

At the completion of the recontainerization/reorganization activity, no wastes should remain at the original Bluff Road site. At this time the stained soils on the site should be removed to lidded containers for future disposal. Also, the liquid in the northern pond should be analyzed and pumped to a tank truck or storage tank to await final

disposal. Finally, any buried drums, such as that which was buried in 1977 to abate its fuming, should be removed. Upon transferal of all wastes at Bluff Road to the staging area, an impermeable soil liner similar to that used in the staging area should be installed at the Bluff Road site. This area can then serve as the staging area during the final remedial action.

6.3 ESTIMATED RESPONSE ACTION COSTS AND SCHEDULE

The estimated costs to perform the actions required to stabilize the existing hazards at the Bluff Road site are presented in Table 6-1. These costs are based on the following assumptions: (1) the adjacent properties recommended for use as staging, buffer and project management areas will be available; (2) twenty hand-augered monitoring wells will be required to identify the location and extent of the contaminated groundwater plume; and (3) recontainerization will be accomplished either by pumping the contents of a deteriorated drum to a new drum or by overpacking the corroding drum.

Whenever possible, recontainerization by pumping to new containers is preferable to overpacking on the basis of the inherent safety risks in the latter method. Overpacking requires some handling of the drum prior to securing its waste contents. Pumping to a new drum may require some handling of the deteriorated drum, but only after its contents have been removed.

Some costs that will inevitably be incurred during response action phase activities at Bluff Road are not included in the total cost estimate. These include the rental costs for the adjacent properties and/or a portion of the Westinghouse site, which are subject to negotiation with the property owners. Also omitted are the costs that might be incurred when traffic must be rerouted away from the Bluff Road site during cleanup activities. Such costs would depend on decisions by the contingency planning team regarding when and how rerouting should take place.

TABLE 6-1
BLUFF ROAD EMERGENCY ACTION PLAN
ESTIMATED RESPONSE ACTION COSTS

Task	Cost	
Contingency Planning	no estimate made	
Groundwater Contamination Study (20 wells, samples and analyses)	$ 22,000	@ 1100./well
Staging Area Clearing (5 sparsely wooded acres)	6,000	@ 1200./acre
Fencing (2700 linear feet, 8 ft. galvanized chain-link)	28,000	@ 10.37/ft.
Clay liner-Staging Area and Storage Area (8 acres)	400,000	@ 50,000/acre
Drum Recontainerization (1,000 drums)	150,000	@ 150./dr.
Drum organization (7,000 drums)	350,000	@ 50./dr.
Contaminated Soil and Debris Removal (100 cu yds)	19,000	@ 90./cu yds
TOTAL ESTIMATED COST	$975,000	

It is estimated that the total cost associated with the measures required to stabilize the hazardous conditions existing at the Bluff Road site and to locate the contaminated groundwater plume is $975,000. This cost is a "best estimate" based on the limited number of hazardous waste site cleanup projects that have taken place to date. It is subject to change with any future change of hazardous waste site cleanup policies or technology, and therefore should be used for planning purposes only.

A projected schedule for implementing the response actions recommended earlier is presented in Figure 6-2. This schedule is based only on broad assumptions regarding the time requirements of individual tasks, but can provide a basis upon which initial response action planning can begin. It should be noted that both a disposal strategy and a protocol for waste consolidation should be designed as soon as possible to allow for the implementation of the response action plan without interim delays.

6.4 SUGGESTED REMEDIAL ACTION APPROACH

Ultimate remedial action at the Bluff Road site will require the examination of various available waste characterization, transportation and disposal alternatives from the standpoints of feasibility and costs. Although such analyses are beyond the intended scope of this report, certain items that should be addressed by the remedial action plan are apparent. It is anticipated that the ultimate cleanup of the Bluff Road site will generally include the following steps:

1. Identification of waste disposal sources, their costs, distances and disposal limitations;

2. Consolidation of compatible wastes destined for common types of disposal;

3. Transportation of the wastes to the selected disposal sites;

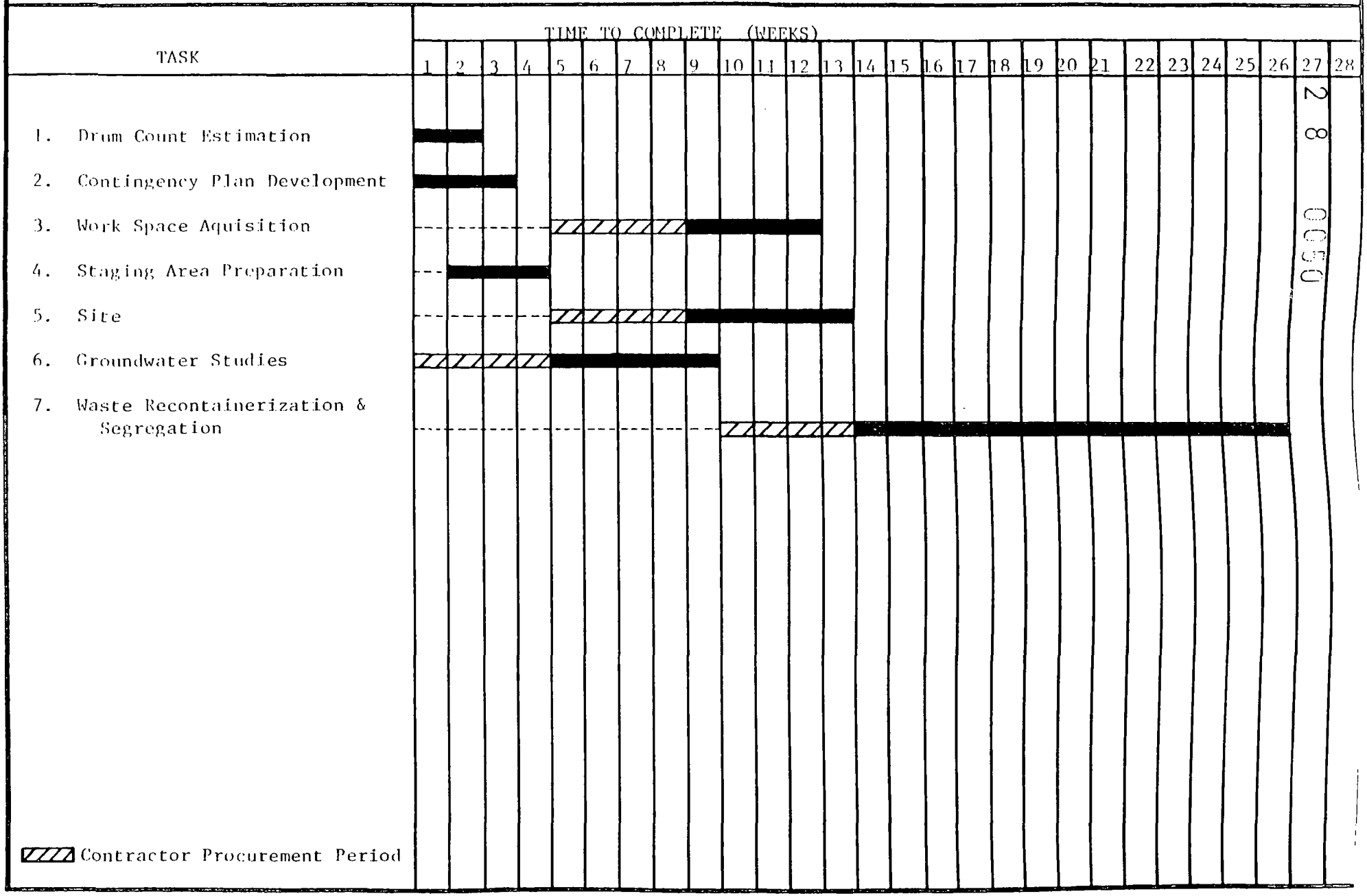
4. Design and construction of a contaminated groundwater plume collection and disposal or treatment system; and

5. Rehabilitation of the Bluff Road site, and of the staging area and the Westinghouse property used during cleanup operations.

Current regulations governing the siting, permitting, and operation of a hazardous waste disposal facility must figure in any attempt to apply on-site disposal methods to the Bluff Road site. Since these regulations can require a lengthy permit application process, and since permit application acceptance by the State is often contingent upon unforseeable public reactions to the site, site cleanup might be most expediously accomplished through off-site waste disposal at existing approved hazardous waste disposal sites. Thus, appropriate, cost-effective off-site disposal methods must be evaluated as part of the remedial action plan design.

Finally, any remedial action plan should address the cost-effectiveness of hauling individual drums of waste versus batching compatible wastes and transporting them in bulk or versus on-site incineration. This analysis must consider the compatability of the wastes at the site and the requirements of the disposal facilities utilized. A strategy for segregating the wastes at the Bluff Road site into groups should address such considerations as the requirements of the disposal facilities, and waste miscibility, pH and phase.

Figure 6-2
BLUFF ROAD EMERGENCY ACTION PLAN
PROJECTED RESPONSE ACTION COMPLETION SCHEDULE



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